

City of Greenville Stormwater Management Program

Greenville, North Carolina



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Mission Statement

The City of Greenville is dedicated to providing all citizens with quality services in an open, ethical manner, insuring a community of distinction for the future.

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EXECUTIVE SUMMARY

In accordance with the State's rule, "15A NCAC 2B .0258 Tar-Pamlico River Basin –Nutrient Sensitive Water Management Strategy: Basinwide Stormwater Requirement," the City of Greenville developed a Stormwater Management Program. The purpose of this Program is to help improve water quality in the Tar-Pamlico River Basin. The City's jurisdictional boundaries also extend into the Neuse River Basin. Figure 1 presented in the City's "Stormwater Management Program" is a general representation of which areas of the City are located within the Tar-Pamlico River Basin and which are within the Neuse River Basin. It also identifies the city limits and the City's extra territorial jurisdiction (ETJ).

As part of its program, the City amended Chapter 9 "Storm Drainage" of Title 9 "Building, Planning, and Development Regulations" located in the "Code of Ordinances" for the City of Greenville. This chapter is now referred to as "Stormwater Management And Control". This ordinance is presented in the program's appendices.

Those requirements as set forth by the Tar-Pamlico Rule will be applicable to that portion of the City of Greenville located within the Tar-Pamlico River Basin. For areas of the City's ETJ located within the Tar-Pamlico River Basin, the City will apply the requirements of its program to the extent authorized under State statutes that govern municipality operations in its ETJ. Under State statutes, the City is authorized to perform inspections and report violations within its ETJ to the appropriate County and State authorities. As areas within its ETJ are annexed into the city limits, the City will be able to enforce these requirements. Those areas of the city and its ETJ located within the Neuse River Basin will be subject to the requirements of this ordinance and program, with the exception of having to meet the requirements for controlling phosphorus releases.

The City's Stormwater Management Program is to be administered by the Engineering Division of the Public Works Department and will be managed by the City Engineer. The City's Stormwater Utility will fund this program. The Engineering Division is responsible for implementation of the program's various elements. The City of Greenville was identified as a NPDES Phase II community. Many of the programs that the City is developing to meet the Phase II requirements will be applied towards those of the Tar-Pamlico Rule.

As part of this program, the City will administer a public education program, addressing residents within and outside Greenville's city limits. The major components of the City's stormwater infrastructure located within the city limits will be mapped as part of the City's NPDES Phase II program, which is to begin in the second year of the City's NPDES Phase II permit. As areas located within the ETJ are annexed into the city limits, the stormwater infrastructure located within these areas to be maintained by this City will be mapped following annexation. The City has started evaluating retrofit opportunities. As presented in the Stormwater Management Program, the City of Greenville will also begin the development of its program to address illicit discharges. The implementation schedule for this component is presented within this program.

In Summary, the overall program objective is to improve the water quality of stormwater runoff that enters the natural waters located in and outside of the City of Greenville.

1. Introduction

In accordance with the State's rule, "15A NCAC 2B .0258 Tar-Pamlico River Basin –Nutrient Sensitive Water Management Strategy: Basinwide Stormwater Requirement," the City of Greenville has developed a stormwater management program.

1-A. Background on the Tar-Pamlico Stormwater Rule

The Tar-Pamlico River Basin begins in Piedmont North Carolina and extends approximately 180 miles through the Coastal Plain to Pamlico Sound. Together, Pamlico Sound and neighboring Albemarle Sound constitute one of the most productive estuarine systems in the country. The 5,400 square mile Tar-Pamlico basin is comprised primarily of agricultural and forest land and many smaller municipalities. Despite the rural character of the basin, in the mid-1970's the Pamlico River estuary began to see increasing frequencies of harmful algal blooms, fish kills, and other nutrient-related problems.

By the mid-1980's, the state began to consider actions to control nutrient inputs to the estuary. Those actions have included the following:

Phase I: In 1989, the North Carolina Environmental Management Commission (EMC) designated the entire basin "Nutrient Sensitive Waters." The first phase of management through 1994 focused primarily on point sources, establishing an annually decreasing nutrient loading cap for an association of dischargers, and an innovative "trading" program that allowed dischargers to achieve reductions in nutrient loading more cost-effectively.

PCS Recycling: In 1992, a phosphate mining company then known as Texas Gulf, which is located on the Pamlico River estuary, instituted a wastewater recycling system that reduced its phosphorus discharges to the estuary by 93 percent.

Phase II: Modeling of estuary conditions showed that despite the gains made to that point, significant reductions in nitrogen and phosphorus loading were still needed to restore water quality standards and minimize the recurrence of harmful algal blooms. The second phase of the nutrient strategy, which runs through 2004, established a biologically based goal of 30 percent reduction in nitrogen loading from 1991 levels and holding phosphorus loading at 1991 levels. Load reductions were apportioned among point sources and the major nonpoint sources. The point sources were given steady annual nitrogen and phosphorus loading caps. A program was designed with the nonpoint sources to achieve the goals through voluntary measures. After two years of voluntary implementation, the EMC found insufficient progress and called for rules for nonpoint sources.

Rules: Beginning in 1998, Division of Water Quality (DWQ) staff conducted a lengthy public input process to evaluate source categories and develop rules where needed. Over the course of 2000, the EMC adopted rules for agriculture, fertilizer application across all land uses, urban stormwater, and rules to protect the nutrient removal functions of existing riparian buffers. These rules were modeled after a similar set of rules recently adopted in the adjacent Neuse River Basin. The Neuse rules were given extensive public review and modification,

and the Tar-Pamlico rules similarly received extensive scrutiny. The resulting rules provide increased flexibility for the regulated community while maintaining the focus of the nutrient reduction goals.

1-B. Requirements of the Tar-Pamlico Stormwater Rule

The Tar-Pamlico Stormwater Rule identifies the City of Greenville as one of the local governments with the greatest likelihood of contributing significant nutrient loads to the Pamlico estuary. The EMC may designate additional local governments in the future through rule amendment based on criteria given in the rule.

The affected local governments are:

| <u>Municipalities</u> | <u>Counties</u> |
|------------------------------|------------------------|
| Greenville | Beaufort |
| Henderson | Edgecombe |
| Oxford | Franklin |
| Rocky Mount | Nash |
| Tarboro | Pitt |
| Washington | |

For these local governments, only their geographic areas that fall within the Tar-Pamlico River Basin are subject to the rule. Part of The City of Greenville's jurisdiction is located within this Basin. Figure 1 in Section 1-C identifies which portion of the City and its extraterritorial jurisdiction is located within the Tar-Pamlico River Basin. In subject counties, applicable areas are those under the direct jurisdiction of the counties, which would not include incorporated cities, towns, or villages within county jurisdictional limits. Cities and counties are encouraged to coordinate to establish implementation responsibilities within municipal extraterritorial jurisdictions. Counties administering development regulations by interlocal agreement on behalf of municipalities would implement the rule within only those municipalities that are subject to the rule. The activities of state entities within subject local governments would be subject to the rule.

The rule establishes a broad set of objectives for limiting nutrient runoff from urban areas and then lays out a set of specific elements that the City of Greenville has included in its program. Timeframes for implementation of the rule are as follows:

| | |
|--------------------|--|
| April 1, 2001: | Effective date of the rule. |
| February 13, 2003: | Target date for approval of the Model Stormwater Program by the Environmental Management Commission (modified through EMC approval from the date of April 1, 2002, established in the rule). |
| February 13, 2004: | Deadline for submittal of local Stormwater Programs (including ordinances) to the EMC (modified as above). |
| August 13, 2004: | Deadline for local governments to begin implementing local Stormwater Programs (modified as above). |

Following implementation in August 2004, the City of Greenville is required to make annual progress reports to the EMC that will include nitrogen and phosphorus loading reduction estimates.

The elements that must be included in the City of Greenville's management program are:

1. New Development Review/Approval

New development is required to meet the 30 percent reduction goal through site planning and best management practices. The rule imposes a 4.0 pounds per acre per year (lb/ac/yr) nitrogen loading limit and a 0.4 lb/ac/yr phosphorus loading limit on new development. Proposals that exceed these performance standards may partially offset their load increases by treating existing developed areas offsite that drain to the same stream.

New development shall avoid causing erosion of surface water conveyances. At minimum, post-development peak flows leaving the site may not exceed pre-development for the 1-year, 24-hour storm event. The rule provides the City of Greenville with the option of using regional stormwater facilities to help meet nutrient loading and attenuation requirements under certain circumstances.

2. Illicit Discharges

Illicit discharges are substances deposited in storm sewers (that lead to streams) that should instead be handled as wastewater discharges. Illicit discharges may contain nitrogen. The City of Greenville will develop and implement a program to identify, remove, and prevent illicit discharges.

3. Retrofit Locations

There are a number of funding sources available for water quality retrofit projects such as the Clean Water Management Trust Fund and the Wetland Restoration Program that the NC General Assembly has recently established. To assist technical experts, the City of Greenville is required to identify sites and opportunities for retrofitting existing development to reduce total nitrogen and phosphorus loads.

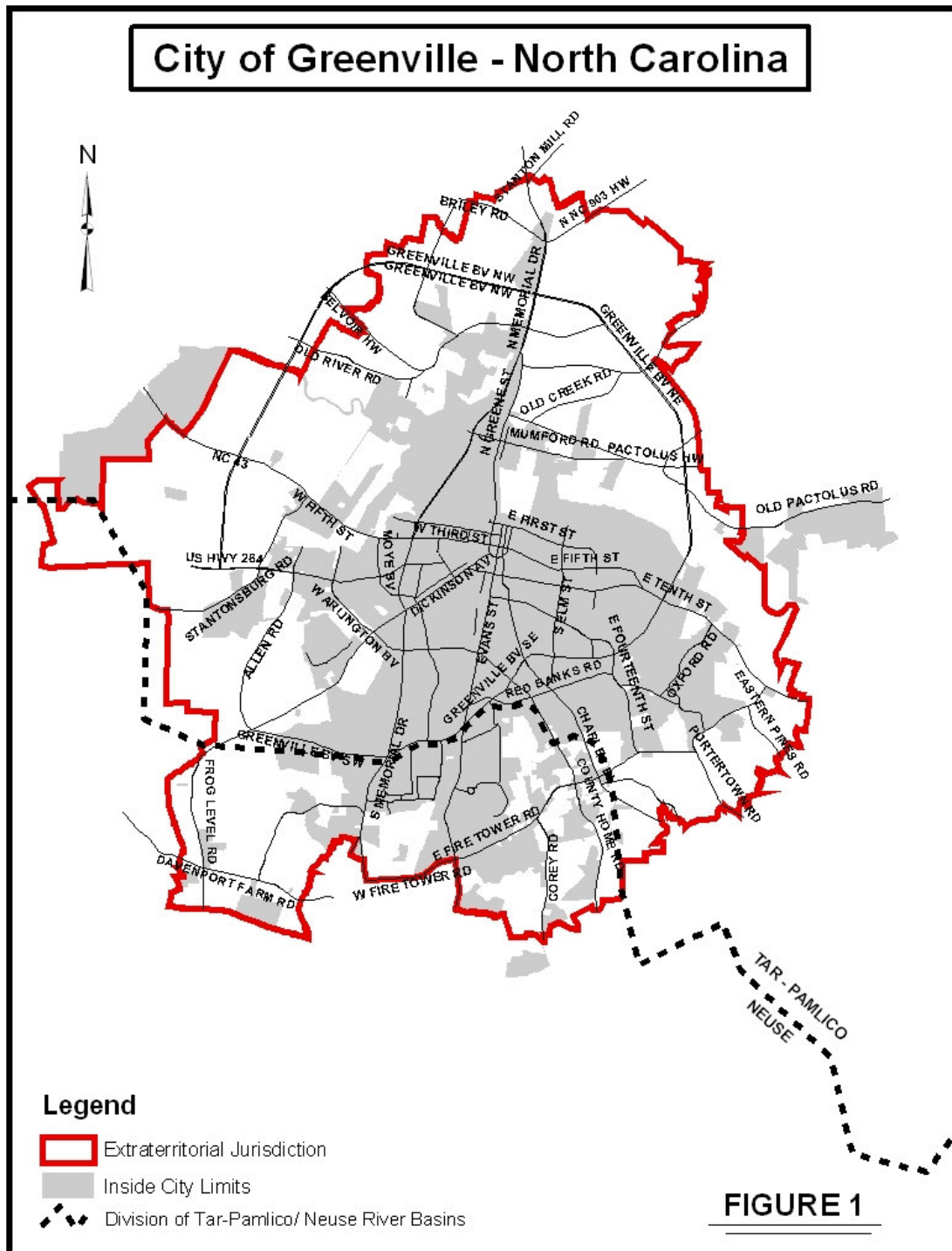
4. Public Education

Citizens can reduce the nitrogen pollution coming from their lawns and septic systems if they understand the impacts of their actions and respond with appropriate management measures. The City of Greenville shall develop and implement public and developer education programs for the Tar-Pamlico basin.

1-C. Applicability of Tar-Pamlico Stormwater Rule

Figure 1 identifies which areas of the City are within the Tar-Pamlico River Basin and which are within the Neuse River Basin. It also identifies the current city limits and the City's extraterritorial jurisdiction (ETJ). Those requirements as set forth by the Tar-Pamlico Rule will be applicable to the portion of Greenville's city limits located within the Tar-Pamlico River Basin under its "Stormwater Manangement and Control" ordinance. For areas of the City's ETJ located within the Tar-Pamlico River Basin, the City will apply the requirements of its program to the extent authorized under State statutes that govern municipality operations

in its ETJ. Under State statutes, the City is authorized to perform inspections and report violations within its ETJ to the appropriate County and State authorities. Those areas of the City and its ETJ located within the Neuse River Basin will be subject to the requirements of this ordinance and program, with the exception of having to meet the requirements for controlling phosphorus releases. As areas within it's ETJ are annexed into the city limits, the City will be able to enforce these requirements.



2. New Development Review/Approval

2-A. Requirements in the Rule

The Tar-Pamlico Stormwater Rule has the following requirements for new development located within that portion of the City of Greenville and its ETJ within the Tar-Pamlico River Basin (Please refer to Appendix A for complete language):

- ❑ The nitrogen load contributed by new development activities is held at 4.0 pounds per acre per year. This is equivalent to 70 percent of the estimated average nitrogen load contributed by non-urban areas in the Tar-Pamlico River Basin (as defined using 1995 LANDSAT data). Similarly, the phosphorus load contributed by new development activities is held at 0.4 pounds per acre per year, which is equivalent to the estimated average phosphorus load contributed by non-urban areas in the basin. The Environmental Management Commission may periodically update these performance standards based on the availability of new scientific information.
- ❑ Property owners shall have the option of partially offsetting projected nitrogen loads by providing treatment of existing developed areas off-site that drain to the same stream. However, the total nitrogen loading rate cannot exceed 6.0 pounds per acre per year for residential development or 10 pounds per acre per year for non-residential development.
- ❑ There is no net increase in peak flow leaving the developed site from the predevelopment conditions for the 1-year, 24-hour storm.
- ❑ The City of Greenville will review new development plans to assure compliance with requirements for protecting and maintaining riparian areas as specified in 15A NCAC 2B .0259.

The City of Greenville may include regional stormwater facilities in their programs to provide for partial nutrient and flow control. Such facilities may not degrade surface waters. This is further discussed under Section 2-G.

To comply with the aforementioned requirements, the City renamed and amended Chapter 9 “Storm Drainage” of Title 9 “Building, Planning, and Development Regulations” located in the “Charter and Code of Ordinances” for the City of Greenville, and this chapter is now referred to as “Stormwater Management And Control”, which is presented in Appendix E).

The Engineering Division of the Public Works Department is responsible for reviewing plats and plans for private developments for compliance with the “Building ,Planning, and Development Regulations” Ordinance. Once the Engineering Division has completed its review and determines them to be in compliance, the documents are forwarded to the Planning Division for development permit issuance.

During this review process, review comments for each plat or plan is entered into a Land Development Tracking System. On a quarterly basis, data on approved projects will be retrieved from the Land development Tracking System. This data will be used to generate annual reports to DWQ on Nitrogen and Phosphorus loading from new development projects.

2-B. Protecting Riparian Areas on New Development

The Tar-Pamlico Riparian Buffer Protection Rule, 15A NCAC 2B .0259, requires the City of Greenville to ensure that riparian areas on new developments are protected in accordance with the buffer rule's provisions. The buffer rule requires that 50-foot riparian buffers be maintained on all sides of intermittent and perennial streams, ponds, lakes and estuarine waters in the basin. The buffer rule provides for certain "allowable" uses within the buffer with DWQ approval such as road and utility crossings.

The City of Greenville shall disapprove any new development activity proposed within the first 50 feet adjacent to a waterbody that is shown on either the USGS 7.5 minute topographic map or the NRCS Soil Survey map unless the owner can show that the activity has been approved by DWQ. DWQ approval may consist of the following:

- ❑ An on-site determination that surface waters are not present.
- ❑ An Authorization Certificate from DWQ for an "allowable" use such as a road crossing or utility line, or for a use that is "allowable with mitigation" along with a Division-approved mitigation plan. A table delineating such uses is included in the buffer rule.
- ❑ An opinion from DWQ that vested rights have been established for the proposed development activity.
- ❑ A letter from DWQ documenting that a variance has been approved for the proposed development activity.

2-C. Calculating N and P Export from New Development

New Development Described: For the purposes of the City of Greenville's Stormwater Management Program, new development shall be described to include the following:

- ❑ Any activity that disturbs greater than one acre of land to establish, expand, or replace a single family or duplex residential development or recreational facility. For individual single family residential lots of record that are not part of a larger common plan of development or sale, the activity must also result in greater than ten percent built-upon area.
- ❑ Any activity that disturbs greater than one-half an acre of land to establish, expand, or replace a multifamily residential development or a commercial, industrial or institutional facility.

- ❑ Projects meeting the above criteria that replace or expand existing structures or improvements and that do *not* result in a net increase in built-upon area shall not be required to meet the basinwide average non-urban loading levels.
- ❑ Projects meeting the above criteria that replace or expand existing structures or improvements and that result in a net increase in built-upon area shall achieve a 30 percent reduction in nitrogen loading and no increase in phosphorus loading relative to the previous development. Such projects may achieve these loads through onsite or offsite measures or some combination thereof.
 - Multi-family residential, commercial, industrial, and institutional projects may choose to achieve all of this reduction by providing treatment of off-site developed areas, or by permanently conserving land from future development in conformance with the the City of Greenville’s approved land conservation plan as described in Section 2-G.
 - Alternatively, any project that is subject to the above loading requirements and that is located within an area that the City of Greenville has established for redevelopment, as characterized here, in a pattern conducive to the goals of the Tar-Pamlico nutrient strategy, may not be required to achieve those nutrient reductions if the project meets certain conditions that are established for that area as follows:
 - A “fix it first” policy that reserves public funds for repair of existing infrastructure in these areas before investing in new infrastructure of the same type in new growth areas.
 - Mixed use/mixed density zoning provisions.
 - Retrofits are consistent with NCDOT definitions for pedestrian scale in traditional neighborhood developments (e.g., 80% of users are within a ¼ mile walk from schools, libraries, and recreational/athletic facilities, 60% of students and 50% of teachers are within ½ mile walk from schools, and 40% of congregants are within ¼ mile of churches).
 - Parking maximums or shared parking ratios.
 - Residential density bonuses where parking maximums, pedestrian scale, or “fix it first” are proposed.
- ❑ Built-upon area means that portion of a development project that is covered by impervious or partially impervious cover including buildings, pavement, and gravel area. Slatted wooden decks and the water surface area of pools shall be considered pervious.
- ❑ Land disturbance is defined as grubbing, stump removal, grading, or removal of structures.

New development shall not include agriculture (including intensive livestock operations), mining, or forestry activities.

Vested Rights: All site plans and preliminary plats for new development projects that have received approval from the City of Greenville prior to the effective date of this program (September 10, 2004) and that have implemented that development in accordance with the City of Greenville’s vesting provisions shall be exempt from the requirements of the Tar-

Pamlico Stormwater Rule. Vesting provisions and timelines shall be in accordance with Section 9-4-34 of the City of Greenville Code of Ordinances for site plans and Section 9-5-41 for preliminary plats.

Projects that require a state permit, such as landfills, NPDES wastewater discharges, land application of residuals and road construction activities shall be considered exempt if a state permit was issued prior to the effective date (September 10, 2004) of the City of Greenville's Stormwater Management Program.

Calculating N and P Export: The nitrogen and phosphorus export from each new development must be calculated. This export will be calculated in pounds per acre per year (lbs/ac/yr). Worksheets to carry out this method are provided in Appendix B.

It is expected that some values provided in the methodology will be refined over time. The Division of Water Quality plans to provide those refinements to the City of Greenville on a periodic basis as they are established. For example, additional research may lead to refined export values for the various urban land covers, particularly rooftop and transportation impervious surface. Also, stormwater management practices are typically in various stages of refinement around the country. Several nutrient reducing BMPs are being applied and studied around North Carolina toward better designs and more accurate knowledge of long-term nutrient removal efficiencies. The City of Greenville will incorporate these refinements into its program from time to time as they are substantiated.

For a given project, the methodology calculates a weighted annual load export for both nitrogen and phosphorus based on event mean concentrations of runoff from different urban land covers and user-supplied acreages for those land covers. The user chooses BMPs that reduce the export to rule-mandated levels. Two versions of the spreadsheet were developed based on rainfall differences; one (the "Piedmont" version) for the jurisdictions of Oxford, Henderson, Rocky Mount, and Tarboro, and the counties of Franklin, Nash, and Edgecombe, and the other (the "Coastal Plain" version) for the remaining communities.

A residential worksheet is also provided in Appendix B to calculate acreages dedicated to different land covers in residential developments where impervious footprints are not shown. One situation not addressed by the methodology is a non-residential subdivision where the impervious surfaces are not shown on the plans at the time of submittal. In this case, the applicant shall determine a worst-case scenario for the areas of impervious surface and managed open space for the type of development specified and then apply the methodology. This determination shall be presented on the preliminary plat as part of its approval.

2-D. BMPs for Reducing Nitrogen and Phosphorus

The Tar-Pamlico Stormwater Rule requires that all new developments achieve a nitrogen export of less than or equal to 4.0 (and a phosphorus export of less than or equal to 0.4 pounds per acre per year. If the development contributes greater than 4.0 pounds nitrogen (or 0.4 pounds phosphorus), then the following options exist.

For residential (or commercial or industrial) development:

- ❑ If the computed nitrogen export is greater than 6.0 (or 10.0) lbs/ac/yr, then the owner must either use on-site BMPs or take part in an approved regional or jurisdiction-wide stormwater strategy or some combination of these to lower the nitrogen export to at least 6.0 (or 10.0) lbs/ac/yr. The owner may then use one of the following two options to reduce nitrogen from 6.0 (or 10.0) to 4.0 lbs/ac/yr.
- ❑ If the computed nitrogen export is greater than 4.0 lbs/ac/yr but less than 6.0 (or 10.0) lbs/ac/yr, then the owner may either:
 - Install BMPs onsite or take part in an approved regional or jurisdiction-wide stormwater strategy or some combination of these to remove nitrogen down to 4.0 lbs/ac/yr.
 - Provide treatment of an offsite developed area that drains to the same stream to achieve the same nitrogen mass loading reduction that would have occurred onsite.
- ❑ The owner must install BMPs that also achieve a phosphorus export of less than or equal to 0.4 lbs/ac/yr but may do so through on-site or offsite measures or some combination thereof.

As with most resource impacts, an ounce of stormwater prevention is worth a pound of cure. A sound site planning process first considers the ability to achieve the needed reductions using site design measures that avoid or minimize runoff to begin with. These planning measures include reducing, disconnecting, and rerouting impervious surfaces, maximizing time of concentration for stormwater, and protecting open spaces for infiltration and evapotranspiration. More detail on planning measures that reduce hydrologic and nutrient loading is given in Appendix C.

Often, structural management practices cannot be avoided. BMP selection is an important and challenging craft. Available data indicate that most BMPs remove only 20 to 40 percent of total nitrogen or phosphorus on a consistent basis. There are a number of issues to consider to ensure this sustained performance. It is crucial to consider the issues of aesthetics, long-term maintenance, safety, and reliability in BMP design. All BMPs require regular maintenance and some have varying performance depending on soil type and season. The efficiencies provided below and in the load calculation worksheets in Appendix B assume correct sizing and other design per the referenced manuals and optimum performance based on regular, effective maintenance as well as proper siting of the practices.

The BMPs available for nutrient reduction and their removal rates based on current literature studies are provided in Table 2 below. These median values are based on a literature review conducted by a contractor that updated Neuse nitrogen efficiencies and established phosphorus values. Also provided in the table are the design standards to be adhered to in permitting BMP design.

The design of Best Management Practices that remove nitrogen and phosphorus from stormwater is a developing field. Researchers throughout the country, particularly in the Southeast, are conducting studies to identify and refine effective means of controlling nitrogen

and phosphorus. As stated in Section 2-C, the Division of Water Quality plans to provide refinements in the stated BMP removal efficiencies to the City of Greenville on a periodic basis as they are substantiated.

Table 2: BMP Types, TN and TP Removal Rates, and Design Standards

| BMP Type | TN Removal Rate per Literature Review | TP Removal Rate per Literature Review | Appropriate Design Standards |
|---|--|--|---|
| Wet detention ponds | 25% | 40% | NC Design Manual (*) |
| Constructed wetlands | 40% | 35% | NC Design Manual (*) |
| Restored riparian buffers | 30% | 30% | Tar-Pamlico Riparian Buffer Rule (15A NCAC 2B .0259) |
| Grass Swales | 20% | 20% | NC Design Manual (*) |
| Vegetated filter strips with level spreader | 30% | 30% | NC Design Manual (*) and other literature information |
| Bioretention (rain gardens) | 40% | 35% | NC Design Manual (*) |
| Sand Filters | 35% | 45% | NC Design Manual (*) |
| Proprietary BMPs | Varies | Varies | Per manufacturer subject to DWQ approval |
| Other BMPs | Varies | Varies | Subject to DWQ approval |

(*) *The North Carolina Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section, Stormwater Best Management Practices Manual, 1999, and all amendments*

Multiple BMPs: The worksheet provides calculation space for the case where more than one BMP is installed in series on a development. It determines the removal rate through serial rather than additive calculations. This is important to understand in projects where the automated worksheet is not used to estimate the effect of multiple BMPs.

As an example, if a wet detention pond discharges through a restored riparian buffer, then the removal rate shall be estimated to be 47.5 percent, determined as follows: The pond removes 25 percent of the influent nitrogen mass and discharges 75 percent to the buffer. The buffer then removes 30 percent of the remaining 75 percent of the original nitrogen amount that discharged from the pond, or 22.5 percent of the original influent amount. The sum of 25 and 22.5 is 47.5. The removal rate is NOT 25 percent plus 30 percent.

Assigning Values to Pervious Cover: Large-lot residential development may involve substantial open space that, at least initially, may remain in an undisturbed wooded or reforestation condition. While it may seem logical to enter this acreage as wooded pervious, without conservation easements or some other mechanism for ensuring protection of these areas, the City of Greenville has no control over their eventual condition. Thus, unless specific protection instruments, such as conservation easements, are established and provided in the development application or by the City of Greenville, lot areas shall be assigned the lawn/landscape managed pervious export rate. The worksheet will do this automatically.

Riparian buffers protected under the Tar-Pamlico Riparian Buffer Protection rule, 15A NCAC 2B .0259, are divided into two zones, moving landward from the surface water, that are afforded different levels of protection. Zone 1, the first 30 feet, is to remain essentially undisturbed, while zone 2, the outer 20 feet, must be vegetated but may be managed in certain

ways. The user shall enter the acreage in zone 1 into the worksheet as wooded pervious, while zone 2 acreage shall be entered as managed pervious (lawn/landscape).

2-E. Calculating Peak Runoff Volume

The Tar-Pamlico Stormwater Rule requires that new development not cause erosion of surface water conveyances. At a minimum, new development shall not result in a net increase in peak flow leaving the site from pre-development conditions for the 1-year, 24-hour storm event. A number of Neuse local governments sought to use the 2-year rather than the 1-year storm as the design storm for peak flow control given that the 2-year storm is more consistent with current hydrologic modeling methodologies.

The main reason that the rule requires a 1-year design storm for peak flow control is to protect stream channels from erosion. Development on land causes many changes in stormwater hydrology. One of the major causes of streambank erosion in urban streams is the increase in the frequency of the bankfull-flooding event. The bankfull-flooding event generally occurs at approximately a 1.5-year frequency. The Tar-Pamlico Stormwater Rule requires control of the 1-year storm to predevelopment levels to insure that the rate of release will be below bankfull and therefore less erosive to the stream channel. Releasing the 2-year storm at predevelopment levels would likely have the effect of increasing the frequency of a storm that is just a bit larger than the most erosive storm.

Protecting streambanks from erosion is a crucial part of the overall Tar-Pamlico Nutrient Sensitive Waters Management Strategy. Riparian buffers are protected under this program because in most situations they are effective at removing nitrogen resulting from nonpoint source pollution. The use of nitrogen reducing BMPs on new development does not obviate the need to maintain valuable riparian buffers.

In the Neuse process, DWQ staff devised a strategy, which is incorporated here, to allow use of the 2-year design storm while also providing a similar level of protection for streambanks as the use of the 1-year design storm. The strategy is to give the City of Greenville the option of using the 2-year storm as the design storm for peak flow control; however, requiring that it be controlled to the pre-development levels of the 1-year storm. This can be done by computing the peak flow associated with the 2-year storm for pre-development conditions and then reducing it by an appropriate percentage to reflect the difference between the 1-year and 2-year storm peak flows. The City of Greenville will allow either of the following two options:

Option 1: Use the 1-year Design Storm

The US Weather Bureau (Technical Paper 40) published maps of rainfall depths for the 1-year storm of duration 30 minutes to 24 hours. The 1-year, 24-hour precipitation, varies along the Tar-Pamlico River Basin. For the City of Greenville, the amount of precipitation for a 1-year, 24-hr storm is 3.4 inches.

The Rational Method is an acceptable method for estimating peak discharge in the design of stormwater facilities for relatively small watersheds (up to 50 acres). The basic equation is:

$$Q = CIA$$

Where: Q is the peak flow for the design storm in cubic feet per second
 C is the coefficient of runoff based on land cover (dimensionless)
 I is the storm intensity in inches per hour
 A is the drainage area in acres

The rational equation is based upon the assumption that rainfall is uniformly distributed over the entire drainage area at a steady rate, causing the flow to reach a maximum at the outlet of the watershed at a time to peak, T_p . The Rational Method typically gives a conservative estimate of runoff.

In order to use the Rational Method to determine peak flows, it is necessary to compute the storm intensity in inches per hour for the 1-year storm. The intensity is computed by the formula:

$$I = g/(h+T)$$

Where: I is the storm intensity in inches per hour
 g and h are empirically derived constants
 T is the duration in minutes (or $(L^3/H)^{0.385}/128$)

The values for constants g and h for the 1-year storm are not presently available. The appropriate values for g and h were estimated by graphing the 2, 5, 10, 25, 50 and 100-year values of g and h for Wake and Wilson Counties as a function of return period on a log-normal scale and determining the y-intercept of the best-fit line. For the City of Greenville, the resulting values of $g = 112$ and $h = 20$ are applicable in the Tar-Pamlico River Basin.

Option 2: Use the 2-year Design Storm, but Control it to 1-year Predevelopment Levels

This option involves the following three steps:

- ❑ First, compute the peak flows (both pre- and post-development) from the drainage area based on the 2-year design storm using one of the methodologies listed below.
- ❑ Second, estimate the 1-year pre-development peak flow by multiplying the 2-year predevelopment peak flow by 80%.
- ❑ Third, design a BMP that will control the 2-year post-development peak flow to 1-year pre-development peak flow levels (estimated by the second step).

Exceptions to the Peak Flow Requirement

Peak flow control is not required for developments that meet one or more of the following requirements:

- ❑ The increase in peak flow between pre- and post-development conditions does not exceed 10 percent (note that this exemption makes it easier to conduct redevelopment activities).
- ❑ The development occurs in a part of a drainage basin where stormwater detention can aggravate local flooding problems.

Acceptable Methodologies for Computing Peak Flow

Acceptable methodologies for computing the pre- and post-development conditions for the design storm include:

- ❑ The Rational Method
- ❑ Dr. Rooney Malcom, P.E., Small Watershed Method
- ❑ NRCS Methodologies applied through the Corps of Engineers HEC-1 Program
- ❑ The Peak Discharge Method as described in USDA Soil Conservation Service's. Technical Release Number 55 (TR-55)
- ❑ The Putnam Method
- ❑ Other methods approved by the Environmental Management Commission

The same method must be used for both the pre- and post-development conditions.

2-F. Offsite Partial Offset Option

The Tar-Pamlico Stormwater Rule provides the option to partially offset nitrogen load increases from new development by providing treatment of offsite developed areas. The developer must provide legal assurance of the dedicated use of the off-site area for the purposes described here, including achievement of specified nutrient load reductions and provision for regular operation and maintenance activities, in perpetuity. The legal assurance shall include an instrument, such as a conservation easement, that maintains this restriction upon change of ownership or modification of the off-site property. Before using off-site treatment, the new development must attain a maximum nitrogen export of six (6) pounds/acre/year for residential development and ten (10) pounds/acre/year for commercial or industrial development.

Typical features of such an offsite offset project that distinguish it from regional systems (described in section 2-G) include the following:

- ❑ The new development site does not typically drain into the offsite treatment facility.
- ❑ The offsite facility is retrofitted to treat an existing developed property.
- ❑ The offsite facility may address only the nutrient requirements unless a development proposal demonstrates that meeting some or all attenuation requirements offsite will not result in degradation of surface waters to which the new development site discharges.

In consideration of this option, the City of Greenville will require a developer submit the appropriate documentation and calculations with their plat and plans that demonstrate the following:

- Projects reduce nitrogen load onsite to 6 lb/ac/yr for residential, 10 lb/ac/yr for commercial, industrial.
- Offsite location achieves remaining nitrogen reduction requirement.
- Projects reduce phosphorus loading to 0.4 lb/ac/yr between onsite and offsite BMPs.
- Projects meet the flow attenuation requirements of the Rule.

- The offsite property drains to the same receiving body of water as the new development project.
- Current owners agree in a documented, enforceable manner that offsite facilities are dedicated to achieving the specified nutrient and flow reductions for the life of the new development.
- All future owners of both properties will understand and accept these restrictions at the time of purchase.
- Current and future owners of the new development will maintain stormwater facilities on both the new development and the offsite properties.

Plats and plans for projects are required to show easements, buffers, and other applicable restrictions. The Engineering Division maintains records of plats within its planning jurisdiction. Consideration of these records is part of the Engineering Division's review process for projects. As per Section 9-9-8 of the Code of Ordinances for the City of Greenville, a developer is required to submit a maintenance plan and complete annual inspection reports for BMPs on their properties. In addition to its annual inspection program, the City will utilize this information as a mechanism for tracking offsite partial offsets and to assure that these areas will be maintained.

2-G. Regional or Jurisdiction-Wide Approaches

The Tar-Pamlico Stormwater Rule provides local governments the option to develop regional or jurisdiction-wide stormwater facilities in its program as an alternative means for developers to address nutrient or flow control requirements. Currently, the City of Greenville does not have plans for a regional facility. However, if the City determines that it would be beneficial to develop such facilities, they would require the review and approval of the North Carolina Department of Environment and Natural Resources, Division of Water Quality. At such time, the City of Greenville will develop appropriate ordinances, guidelines, and requirements for these types of facilities and also establish appropriate tracking processes, mechanisms, legal instruments, etc. to ensure that regional or jurisdiction-wide approaches continually meet attenuation and loading requirements of the Tar-Pamlico Stormwater Rule.

Regional Facilities: Within the context of the rule, the concept of a regional facility means generally a stormwater facility that serves more than one development project, each of which drains to the facility for treatment or attenuation. Inflows to regional facilities may already be partially treated or attenuated.

Many individual developments include stormwater designs that could be interpreted as "regional" under the broadest of definitions but which are not intended for the type of review and approval process described here. Projects such as phased developments or commercial projects with outparcels may use common stormwater facilities that receive runoff from more than one development under different ownership. However, common facilities that are permitted under single projects are intended for permitting by the City of Greenville.

Regional facilities provided for in the rule would serve more than one development project. They could be publicly or privately owned but would be proposed to DWQ by the City of Greenville. Basic elements of regional system proposals, to be permitted by DWQ, and other “common-facility” individual projects permitted by the City of Greenville would be the same.

Jurisdiction-Wide Approach: Within the context of the rule, the concept of a jurisdiction-wide approach means generally a nutrient-reducing management measure implemented under the authority of a local government to offset one or more increases that may take place in the same or a separate watershed within the jurisdiction. An offsite offset project (see Section 2-F) that is implemented under the authority of a local government would be a specific type of jurisdiction-wide approach.

2-H. BMP Maintenance

BMPs implemented to achieve the nitrogen and phosphorus loading reduction and flow attenuation requirements for a development must be maintained as established in Sec. 9-9-8 in the City Code of Ordinances. (Presented in Appendix E.) An example of an operation and maintenance agreement for BMPs is presented in Appendix D. BMPs shall be maintained in accordance with the methods presented in the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section, *Stormwater Best Management Practices Manual*.

The City of Greenville shall inspect all BMPs on an annual basis and will maintain records for BMPs to include types of BMPs, their locations, approved maintenance plans, and required inspection process. The City of Greenville shall notify the owner upon finding that maintenance is needed on a BMP in accordance with Sec. 9-9-8 of the City Code. If the owner does not complete the maintenance in a timely manner, then the City of Greenville shall contract out the maintenance itself and recover its costs in the manner as permitted by this section of the City Code.

2-I. Land Use Planning Provisions

An objective of the Tar-Pamlico Stormwater Rule is to provide the flexibility and incentives for the City of Greenville to improve its growth management practices and for developers to consider using impact-reducing site design techniques that will reduce nitrogen and phosphorus loading from their developments. One such measure, reducing impervious surfaces, reduces the need for BMPs to control nitrogen and peak stormwater flows and also reduces associated BMP maintenance concerns.

The City of Greenville encourages developers to consider the following planning techniques and the general advantages and disadvantages of incorporating the following:

- Pervious Paver
- Pervious concrete/asphalt mixes
- Minimizing use of curb and gutter

- Cluster or open-space developments
- Traditional neighborhood developments
- Mixed-use developments
- Low Impact Development principles
- Other impact-reducing approaches

Descriptions of these techniques are provided in Appendix C.

3. Illicit Discharges

3-A. Requirements in the Rule

The Tar-Pamlico Stormwater Rule requires the City of Greenville establish a program to prevent, identify, and remove illicit discharges. Illicit discharges are flows in the stormwater collection system that are not associated with stormwater runoff or an allowable discharge.

3-B. What is an Illicit Discharge?

Stormwater collection systems are vulnerable to receiving illicit discharges (even though the person responsible for the discharge may be unaware that it is illicit). Depending on their source, illicit discharges may convey pollutants such as nutrients, phenols, and metals to receiving waters. Table 3a identifies some potential flows to the stormwater collection system that may be allowable. Table 3b identifies some discharges that are not allowed.

Table 3a: Discharges that may be allowable to the stormwater collection system

| | | |
|---|--|--|
| Waterline Flushing | Landscape Irrigation | Diverted Stream Flows |
| Uncontaminated Rising Ground Water | Uncontaminated Ground Water Infiltration to Stormwater Collection System | Uncontaminated Pumped Ground Water |
| Discharges From Potable Water Sources | Foundation Drains | Uncontaminated Air Conditioning Condensation |
| Irrigation Water | Springs | Water From Crawl Space Pumps |
| Footing Drains | Lawn Watering | Non-Commercial Car Washing |
| Flows From Riparian Habitats and Wetlands | NPDES Permitted Discharges | Street Wash Water |
| Fire Fighting Emergency Activities | Wash Water From the Cleaning of Buildings | Dechlorinated Backwash and Draining Associated With Swimming Pools |

Table 3b: Types of Discharges that are not allowed to stormwater collection system

| | | |
|--|--|---|
| Dumping of Oil, Anti-Freeze, Paint, Cleaning Fluids | Commercial Car Wash | Industrial Discharges |
| Contaminated Foundation Drains | Cooling Water Unless no Chemicals Added and has NPDES Permit | Washwaters From Commercial/ Industrial Activities |
| Sanitary Sewer Discharges | Septic Tank Discharges | Washing Machine Discharges |
| Chlorinated Backwash and Draining Associated With Swimming Pools | | |

Note: Some of these items may be disposed of through the sanitary sewer system. Please contact the GUC WWTP at 551-1542 for further information.

3-C. *Establishing Legal Authority*

In accordance with Chapter 9 “Stormwater Management and Control” of Title 9 in the City Code of Ordinances (Appendix E), the City of Greenville has established the legal authority to control and prohibit illicit discharges under Section 9-9-17. The purpose and objectives of establishing this authority by ordinance is as follows:

- Control the contribution of illegal pollutants identified in Table 3b to the stormwater collection system.
- Prohibit illicit discharges to the stormwater collection system.
- Prohibit discharge of spills and disposal of materials other than stormwater to the stormwater collection system.
- Determine compliance and non-compliance.
- Require compliance and undertake enforcement measures in cases of non-compliance.

3-D. *Collecting Jurisdiction-Wide Information*

As part of its program, the City of Greenville will collect geographic information within its legal boundary, as defined under State statute, at three increasing levels of detail:

- The first, most cursory level is information that shall be collected for the City’s legal jurisdiction. The associated requirements are discussed in this section.
- The second level is a more detailed screening for high priority areas within the City’s legal jurisdiction. The associated requirements are discussed in Section 3-E.
- The third level is a very detailed investigation that shall be done upon the discovery of an illicit discharge. The associated requirements are discussed in Section 3-F.

The purpose of collecting jurisdiction-wide information is to assist with identifying potential illicit discharge sources and characterizing illicit discharges after they are discovered.

The City of Greenville will compile maps that may include, but not necessarily limited to, the following:

- Location of sanitary sewers in areas of the major stormwater collection systems and the location of areas that are not served by sanitary sewers.
- Waters that appear on the USDA – Natural Resources Conservation Service Soil Survey Maps and the U.S. Geological Survey 1:24,000 scale topographic maps.
- Land uses, such as residential, commercial, agriculture, industrial, institutional, publicly owned open space, and others.

- Currently operating and known closed municipal landfills and other treatment, storage, and disposal facilities, including for hazardous materials.
- Major stormwater structural controls.
- Known NPDES permitted discharges to the stormwater collection system .

Written descriptions for the map components will be as follows:

- A summary table of municipal waste facilities that includes the names of the facilities, the status (open/closed), the types, and addresses.
- A summary table of the NPDES permitted dischargers that includes the name of the permit holder, the address of the facility, and permit number.
- A summary table of the major structural stormwater control structures that shows the type of structure, area served, party responsible for maintaining, and age of structure.
- A summary table of publicly-owned open space that identifies size, location, and primary function of each open area.

The City of Greenville shall complete this collection of jurisdiction-wide information by the time the second annual report is due.

3-E. Mapping and Field Screening in High Priority Areas

Beginning in its third year after implementation , the City of Greenville shall identify a high priority area of its jurisdiction for more detailed mapping and field screening. This high priority area shall comprise at least ten percent of the jurisdiction's area. Each subsequent year, the City of Greenville is responsible for selecting and screening another high priority area that comprises at least 10 percent of its jurisdiction.

“High priority” means the areas where it is most likely to locate illicit discharges. The most likely locations for identifying illicit discharges are areas within older developments. Each year, the City of Greenville shall explain its basis for selection of its high priority areas.

The first part of the screening process for the selected high priority areas is mapping the stormwater system. At a minimum, the map that is produced should include the following:

- Locations of the outfalls, or the points of discharge, of any pipes from non-industrial areas that are greater than or equal to 36 inches.
- Locations of the outfalls of any pipes from industrial areas that are greater than or equal to 12 inches.

- Locations of the outfalls of drainage ditches that drain more than 50 acres of non-industrial lands.
- Locations of the outfalls of drainage ditches that drain more than 2 acres of industrial land.
- An accompanying summary table listing the outfalls that meet the above criteria that includes outfall ID numbers, location, primary and supplemental classification of receiving water, and use-support of receiving water.

The second part of the screening process for the selected high priority area is conducting a dry weather field screening of all outfalls that meet the above criteria to detect illicit discharges. The dry weather field screening shall not be conducted during or within 72 hours following a rain event of 0.1 inches or greater.

Figure 3 illustrates a process for conducting field screening sampling activities and following up with any findings of dry weather flow. As shown in this figure, if the field screening shows that an outfall is dry, then the outfall will be checked for intermittent flow at a later date.

If a field screening shows that an outfall has a dry weather flow, the City of Greenville shall complete a screening report for the outfall. The information that will be contained in the screening report is outlined in Table 3c. Screening reports shall be kept on file for a minimum of five years. Example screening report forms are provided in Appendix F.

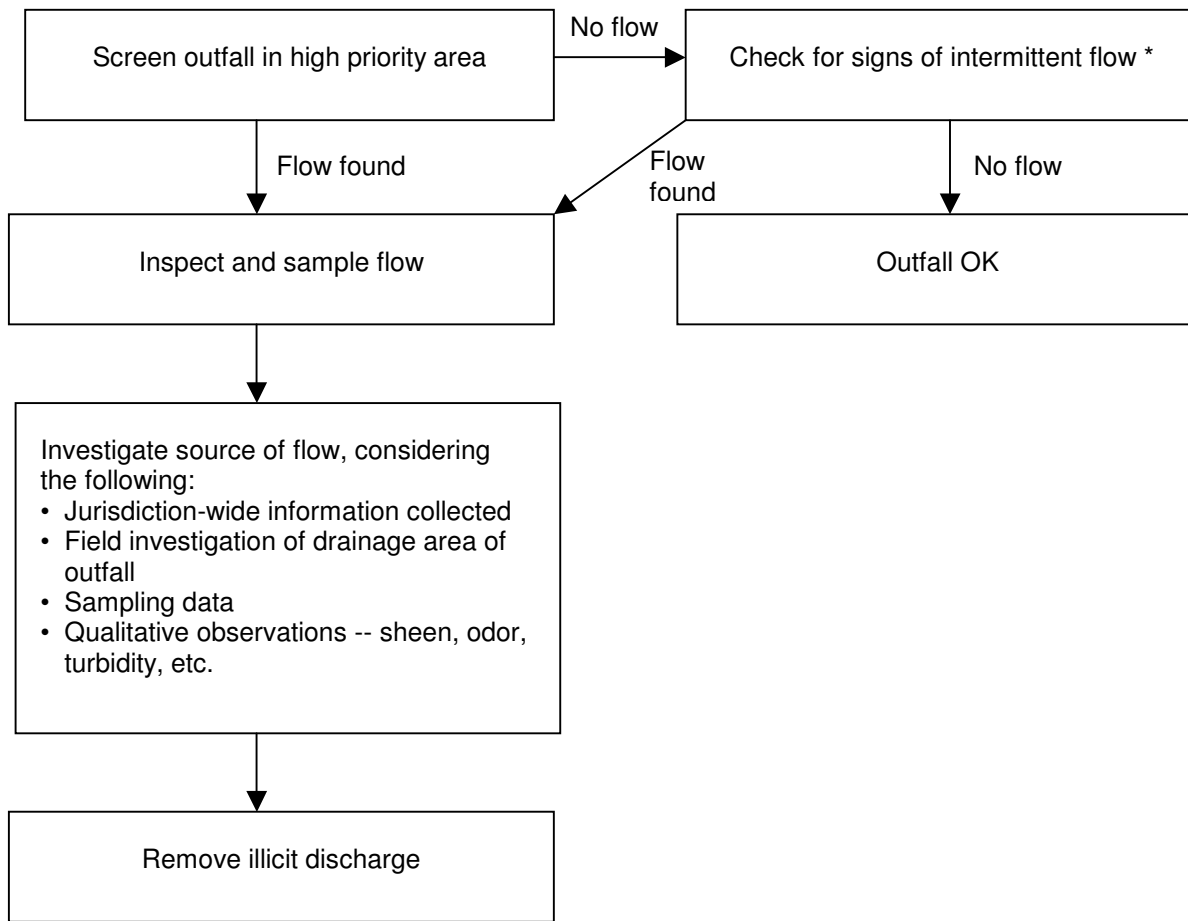
Table 3c: Field Screening Report Information

| | | |
|------------------------|---|--|
| General Information | Sheet Number Outfall ID Number Date Time Date, Time and Quantity of Last Rainfall Event | |
| Field Site Description | Location Type of Outfall Dominant Watershed Land Use(s) | |
| Visual Observations | Photograph Odor Color Clarity Floatables | Deposits/Stains Vegetation Condition Structural Condition Biological Flow Estimation |
| Sampling Analysis * | Temperature pH Nitrogen-Ammonia | Nitrogen-Nitrate/Nitrite Fluoride or Chlorine Total Phosphorus Ortho-Phosphate |

* Analytical monitoring is required only if an obvious source of the dry weather flow cannot be determined through an investigation of the upstream stormwater collection system.

Outfalls with flow will be screened again within 24 hours for the above parameters.

Figure 3: Field Screening Process



* Checking for intermittent flow includes rechecking outfall at a later date as well as visual observations for evidence of intermittent flow.

Note: Analytical monitoring may be conducted only if an obvious source of the dry weather flow cannot be determined through an investigation of the upstream stormwater collection system.

3-F. Identifying and Removing Illicit Discharges

After the field screening is complete, the City of Greenville shall take measures to identify and remove illicit discharges. Identifying illicit discharges may require a combination of office and field work. After the field screening, the City of Greenville shall consult the jurisdiction-wide information they have compiled (see Section 3-D) to obtain information about the land uses, infrastructure, industries, potential sources, and types of pollution that exist in the drainage area of the outfall.

After potential sources have been identified in the office, a systematic field investigation will be completed minimizing the amount of resources required to identify the source. Several

field methods may be used to identify illegal discharges. The City of Greenville will use a simple approach if that will suffice. Listed below are several approaches, but not necessarily limited to, that may be used as part of the inspection process:

- Site Investigation
- Additional Chemical Analysis (recommend testing for fecal coliform if the ammonia concentration was found to exceed 1.0 mg/L)
- Flow Monitoring (recommended to use multiple site visits rather than a depth indicator)
- Dye Testing (fluorescent dye is recommended)
- Smoke Testing
- Television Inspection

Documentation of the results of the office and field investigations shall be kept on file for a minimum of five years with the screening report.

After the City of Greenville identifies the source of an illicit discharge, it shall take enforcement action to have the source removed. The legal authority that was established for the illicit discharge program shall provide the means to accomplish this requirement. Enforcement shall include requiring the person responsible for the discharge to remove or redirect it to the sanitary sewer. If redirected to the sanitary sewer, prior approval from Greenville Utilities Commission will be required by the person responsible for the discharge. There shall be remedies to deal with cases of non-compliance. Records of all compliance actions shall be kept for a minimum of five years with the screening report.

In addition to keeping all screening reports on file, the City of Greenville shall maintain a map that includes the following:

- Points of identified illicit discharges.
- Watershed boundaries of the outfalls where illicit discharges have been identified.
- An accompanying table that summarizes the illicit discharges that have been identified that includes location, a description of pollutant(s) identified, and removal status.

3-G. Preventing Discharges and Establishing a Hotline

The City of Greenville shall contact persons who are responsible for establishments that are likely sources of illicit discharges. Some of these sources include automotive sales, rental, repair and detailing establishments, lawn care companies, cleaners, and certain types of contractors. Previous experience has shown that many illicit discharges are actually unintentional.

The City of Greenville shall establish a hotline. The hotline will require the designation of a new phone number or use an existing service. The hotline shall include a recording advising

citizens what to do if they call during non-business hours. There will be another number given in cases where the illicit discharge is perceived to be an emergency.

3-H. Implementation Schedule

In keeping with their goal of having an efficient and cost-effective program, the City of Greenville has created a phased implementation schedule for illicit discharges (Table 3d). The schedule allows for collecting jurisdiction-wide information during the first year of implementation and then screening the high priority areas during future years. This phased schedule is also intended to allow the City to evaluate and make improvements to its programs as the City progresses through high priority areas.

Table 3d: Implementation Schedule and Annual Reporting Requirements

| Year | Implementation Requirements | Annual Report Requirements |
|---------------------------------|--|---|
| By August 2004 | <ul style="list-style-type: none"> Establish legal authority to address illicit discharges | <ul style="list-style-type: none"> Submit report identifying established legal authority to meet requirements. |
| By October 2006 | <ul style="list-style-type: none"> Collect jurisdiction-wide information. Select high priority area for additional screening. Initiate illicit discharge hotline. | <ul style="list-style-type: none"> Report on completion of jurisdiction-wide information collection. Submit map of high priority areas and reason for selection. Report on initiation of illicit discharge hotline. |
| Each subsequent year after 2006 | <ul style="list-style-type: none"> Complete mapping and field screening for high priority area. Select next high priority area. Identify and remove illicit discharges as encountered. Continue operating illicit discharge hotline. | <ul style="list-style-type: none"> Submit map of stormwater collection system in high priority area upon request by DWQ. Document illicit discharges found and resulting action. Report on hotline usage and actions taken. Submit map of next high priority area and reason for selection. |

4. Retrofit Locations

4-A. Requirements in the Rule

As part of its program, the City of Greenville will identify and prioritize places within existing developed areas that are suitable for retrofits.

4-B. Approach for Meeting the Requirements

Retrofit opportunities will be considered acceptable if all of the following conditions have been investigated:

- The retrofit, if implemented, clearly has the potential to reduce nitrogen or phosphorus loading to the receiving water.
- The watershed is clearly contributing nitrogen or phosphorus loading above background levels.
- The landowner where the retrofit is proposed is willing to have the retrofit installed on his property. Securing the landowner's cooperation is one of the most important tasks for the local government, as this is often the most difficult aspect of implementing a retrofit.
- There is adequate space and access for the retrofit.
- It is technically practical to install a retrofit at that location.

The minimum number of retrofit opportunities that the City of Greenville is required to identify is three. Sites may be carried over to meet the minimum requirements for up to two subsequent years provided that BMPs/retrofits have not been implemented and the site continues to meet the criteria above on an annual basis.

4-C. Data Collection and Notification

Each retrofit opportunity that is identified shall be accompanied by information to describe the location of the retrofit being proposed, the property owner, as well as basic information about the watershed and the receiving water. Table 4 is the format in which the City will present the information for each retrofit opportunity. This information shall be included as part of the City's annual report to be submitted to the Division of Water Quality on October 30th of each year beginning in the year 2005.

Table 4: Retrofit Opportunity Table

| | |
|--|--|
| Each retrofit opportunity that is identified shall be accompanied by information to describe the location of the retrofit, the type of retrofit being proposed, the property owner, as well as basic | |
| Location description, including directions from a major highway | |
| Type and description of retrofit opportunity | |
| Current property owner | |
| Is the property owner willing to cooperate? | |
| Land area available for retrofit (sq. ft) | |
| Accessibility to retrofit site | |
| Drainage area size (acres) | |
| Land use in drainage area (percent of each type of land use) | |
| Average slope in drainage area (%) | |
| Environmentally sensitive areas in drainage area (steep slopes, wetlands, riparian buffers, endangered/ threatened species habitat) | |
| Approximate annual nitrogen and phosphorus loading from drainage area (lbs/acre/year) * | |
| Potential nitrogen reduction (lbs/ac/yr)* | |
| Potential phosphorus reduction (lbs/ac/yr)* | |
| Estimated cost of retrofit | |
| Receiving water | |
| DWQ classification of receiving water | |
| Use support rating for receiving water | |
| Other important information | |

4-D. Mapping Requirements

The City of Greenville shall provide maps that show the locations of retrofit opportunities, which will include the following parameters:

- Drainage area to retrofit opportunity site.
- Land uses within the drainage area.
- Location of retrofit opportunity.

- Property boundaries in the vicinity of the retrofit opportunity.
- Roads.
- Environmentally sensitive areas (wetlands, riparian buffers, endangered/threatened species habitat – if available).
- Publicly-owned parks, recreational areas, and other open lands.

5. Public Education

5-A. Requirements in the Rule

The Tar-Pamlico Stormwater Rule requires the City of Greenville to develop a locally administered environmental education program to address nitrogen & phosphorous loading issues with the public and developers and to address peak stormwater flow issues with developers.

5-B. Public Education Action Report and Plan

The City of Greenville has developed a Public Education Action Report and Plan, An example Action Report and Plan format is presented in Appendix G. This Report and Plan outlines proposed education activities for an upcoming year identifies target audiences, and anticipated costs of the program. The City of Greenville shall submit an Annual Action Report and Plan to DWQ for approval as part of its annual report.

The Action Report and Plan template in Appendix G identifies point values for each type of education activity that may be used by the City of Greenville. The City of Greenville is required to conduct activities that sum to at least 15 points each year. Ongoing activities, such as continuing programs for pet waste or storm drain marking, receive credit for each year they are continued.

During the first year of program implementation, the City of Greenville will conduct two (2) technical workshops. One shall be designed to educate local government officials and staff and the other for the development community to include: engineers, developers, architects, contractors, surveyors, planners, and realtors. These two workshops will receive point credit toward the annual total. During subsequent years, technical workshops are considered an optional activity.

6. Reporting Requirements

Annual Tar-Pamlico River Basin stormwater program reports must be submitted to the Division of Water Quality by October 30th of each year beginning in 2005. All reports shall contain the following information:

6-A. New Development Review/Approval

The City of Greenville shall be responsible for submitting the following information as part of the annual reporting requirement:

- Acres of new development and impervious surface based on plan approvals.
- Acres of new development and impervious surface based on certificates of occupancy.
- Summary of BMPs implemented and use of offsite options.
- Computed baseline and net change in nitrogen and phosphorus export from new development that year.
- Summary of maintenance activities conducted on BMPs.
- Summary of any BMP failures and how they were handled.
- Summary of results from any applicable jurisdictional review of planning issues.
- Summary of Construction compliance, O & M compliance, inspections and enforcement actions.
- Compliance with program implementation schedule.
- Program administrative changes, other issues for DWQ.

6-B. Illicit Discharges

Table 6a outlines the annual reporting requirements for illegal discharges.

Table 6a: Implementation Schedule and Annual Reporting Requirements

| Year | Implementation Requirements | Annual Report Requirements |
|-----------------|--|--|
| By August 2004 | <ul style="list-style-type: none">• Establish legal authority to address illicit discharges | <ul style="list-style-type: none">• Submit report identifying established legal authority to meet requirements. |
| By October 2006 | <ul style="list-style-type: none">• Collect jurisdiction-wide information.• Select high priority area for additional screening.• Initiate illicit discharge hotline. | <ul style="list-style-type: none">• Report on completion of jurisdiction-wide information collection.• Submit map of high priority areas and reason for selection.• Report on initiation of illicit discharge hotline. |

| | | |
|---------------------------------|--|---|
| Each subsequent year after 2006 | <ul style="list-style-type: none"> • Complete mapping and field screening for high priority area. • Select next high priority area. • Identify and remove illicit discharges as encountered. • Continue operating illicit discharge hotline. | <ul style="list-style-type: none"> • Submit map of stormwater collection system in high priority area upon request by DWQ. • Document illicit discharges found and resulting action. • Report on hotline usage and actions taken. • Submit map of next high priority area and reason for selection. |
|---------------------------------|--|---|

6-C. Retrofit Locations

The City's annual report will include the following on retrofit locations:

- Data on each retrofit opportunity (Table 4 or other equivalent format),
- Maps of potential retrofit sites as specified in Section 4-D, and
- The status of any retrofit efforts that have been undertaken within the jurisdiction.

6-D. Public Education

The City's annual report will also include a summary of the next year's Action Plan and evaluation regarding the implementation of the previous year's Action Plan (if applicable). The report will also include goals, activities completed, realized education program costs, explanation of experienced shortfalls, and possible plans as to address these shortfalls.